

CLAIM AMENDMENTS

1 1. (Currently amended) A method for etching a through via on a wafer of
2 semiconductor material, wherein the wafer has a front side surface and a backside
3 surface, comprising:

4 applying a layer of photoresist material to the backside surface of the wafer;

5 exposing the layer of photoresist to a light source, wherein the developed
6 photoresist is removed to form at least one via in the remaining photoresist layer;

7 baking the remaining photoresist layer in order to harden the remaining
8 photoresist layer, wherein the baking of the remaining photoresist layer comprises a first
9 heating step wherein the remaining photoresist layer is heated at a temperature of
10 about 130°C. to about 135°C. for about one hour, and a second heating step wherein
11 the remaining photoresist layer is heated at a temperature of about 180°C. to about
12 190°C. for about one hour; and

13 gas plasma etching the semiconductor material adjacent to the at least one via to
14 form a through via between the backside surface and the front side surface of the wafer.

1 2. (Canceled)

1 3. (Original) The method according to claim 1, further comprising removing the
2 hardened photoresist layer from the backside surface of the wafer, after the step of gas
3 plasma etching the through via between the backside surface and the front side surface
4 of the wafer.

1 4. (Original) The method according to claim 3, further comprising applying a

2 layer of conductive material to at least a portion of a surface of the through via, after the
3 step of removing the hardened photoresist layer from the backside surface of the wafer.

1 5. (Original) The method according to claim 1, wherein the plasma etching is
2 conducted at a microwave power level in the range of about 700 watts to about 900
3 watts.

1 6. (Original) The method according to claim 1, wherein the plasma etching is
2 conducted at a radio frequency power level in the range of about 300 watts to about 500
3 watts.

1 7. (Original) The method according to claim 1, wherein the plasma etching is
2 conducted at a temperature in the range of about 130°C. to about 170°C.

1 8. (Original) The method according to claim 1, wherein the gas is a mixture of
2 hydrogen gas, argon gas, boron trichloride gas, and hydrogen bromide gas.

1 9. (Currently amended) The method according to claim 8 [[7]], wherein the
2 hydrogen gas flows at a rate in the range of about 6 standard cubic centimeter per
3 minute to about 10 standard cubic centimeters per minute.

1 10. (Currently amended) The method according to claim 8 [[7]], wherein the
2 argon gas flows at a rate in the range of about 15 standard cubic centimeter per minute
3 to about 20 standard cubic centimeters per minute.

1 11. (Currently amended) The method according to claim 8 [[7]], wherein the
2 boron trichloride gas flows at a rate in the range of about 1 standard cubic centimeter

3 per minute to about 5 standard cubic centimeters per minute.

1 12. (Currently amended) The method according to claim 8 [[7]], wherein the
2 hydrogen bromide gas flows at a rate in the range of about 50 standard cubic
3 centimeters per minute to about 80 standard cubic centimeters per minute.

1 13. (Original) The method according to claim 1, wherein the plasma etching is
2 conducted at a pressure in the range of about 2 mTorr to about 8 mTorr.

1 14. (Original) The method according to claim 1, wherein the semiconductor
2 material includes indium phosphide.

1 15. (Original) The method according to claim 1, wherein the semiconductor
2 wafers are incorporated into devices selected from the group consisting of microwave
3 circuits, millimeter wave circuits, and combinations thereof.

1 16. (Original) The method according to claim 1, wherein the semiconductor
2 wafers have a final thickness in the range of about 25 to about 250 μm .

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